IAQ Management Program
The University of Texas at Arlington

INTRODUCTION

Purpose

Most people are aware that outdoor air pollution can damage their health, but many do not know that indoor air pollution can also have a significant effect. U,S. Environmental Protection Agency (EP A) studies of human exposure to air pollutants typically indicate that indoor concentrations of pollutants may be two to five times, and occasionally more than 100 times, higher than outdoor concentrations. Indoor air pollutant concentrations are of particular concern because it is estimated that most people spend approximately 90 percent of their time indoors. Comparative risk studies performed by EP A and its Science Advisory Board have consistently ranked indoor air pollution among the top five environmental health risks to the public.

Failure to prevent indoor air problems, or failure to respond promptly, can have consequences:

- Increasing the potential for long term and short term health problems for students, faculty and staff.
- Negatively impacting the student learning environment, comfort, and attendance.
- Reducing productivity of faculty and staff due to discomfort, sickness, or absenteeism.
- Accelerating deterioration and reducing efficiency of the campus physical plant and equipment.
- Increasing the potential that facilities will have to be closed, or occupants temporarily relocated.
- Creating negative publicity that could damage the campus' or administration's image and effectiveness.

The University of Texas at Arlington (UTA) desires to take a proactive approach to indoor air quality (IAQ) concerns within campus buildings, including the development and implementation of this management program and guidance document. The general goal of the program is to provide clear and easily applied procedures that can be used to help prevent indoor air quality problems and resolve problems promptly if they do arise.

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This guidance is based on the following principles:

- Many IAQ problems can be effectively prevented by campus faculty, staff and students.
- When IAQ problems do arise, they can often be resolved using the skills of existing campus staff-
- The expense and effort required to prevent most IAQ problems is typically much less than the expense and effort required to resolve problems after they develop.

This program is site-specific for UTA and includes policies and procedures for dealing with indoor air quality concerns. The purpose of this program is to reduce the potential for occupant complaints, interruptions of occupancy, and associated potential liability .The effectiveness of any program in this regard is wholly dependent on its implementation. Only a conscientious and thorough implementation of the program, at all levels, will achieve the stated goals.

The specific goals of this program are to:

- "Maintain a living guidance document that better allows UTA's Environmental Health and Safety Office (EH&S) to prevent and resolve IAQ-related issues in a professional and diligent manner.
- Formalize procedures for maintaining and servicing HV AC equipment to maintain or improve indoor air quality in the University's facilities.
- Formalize procedures to assess, document and recommend modifications (if warranted) with regard to the potential for various campus departments' activities to adversely impact indoor air quality.
- Formalize procedures, by which indoor air quality complaints are handled, corrected and documented.
- Formalize procedures to assess document and correct the potential for renovation activities to affect a building's indoor air quality.
- Formalize procedures to address special-use facilities, such as research and instructional laboratories, which may have a greater risk of impacting building indoor air quality.
- Provide and maintain a training program that introduces the IAQ Management Plan, and provides additional information and tools to address IAQ at the University.

This program is not intended to generate baseline indoor air quality data for any of the buildings, nor is it intended to document the current condition or maintenance status of any of the existing buildings or HV AC equipment on the campus. Rather, this program is intended to provide the protocols and guidance for the University to assess IAQ-related issues on a continuing basis.

While this program is based on the applications of generally accepted practices for reducing indoor air quality concerns, no such program can guarantee that complete protection will be afforded. Revisions to this program will be needed as detection and control technologies, and applicable rules and regulations, continue to evolve.

Scope

EH&S has worked closely with various campus departments and outside consultants to develop an IAQ Management Program that is user friendly, easy to implement and addresses the following functional areas:

- Program Implementation by EH&S
- HVAC System Maintenance-
- Building Operations and Maintenance-
- Building Renovations and New Construction. .Custodial Services.
- Pest Control Services.
- Housing and Food Services. .Special-Use Buildings. .Employee Training.

In general terms, EH&S will have responsibility for the implementation and maintenance of the IAQ Management Program, complaint response, investigation/assessment, and overall indoor air quality for the University. However, everyone on campus can positively (or negatively) affect indoor air quality.

EH&S intends to implement and maintain this IAQ Management Program for UTA facilities both at the main campus m Arlington and the UTA Fort Worth Riverbend campus. These facilities collectively include approximately 100 buildings generally classified into the following functional

types: research facilities; laboratories; libraries; education buildings; administration buildings; dormitories, apartments, food service facilities, and maintenance and recreation facilities.

How to Use This Document

This program contains the practices, procedures, and methodologies that will assist UTA in reducing IAQ concerns at its campuses. This document also contains the policies and procedures for handling IAQ complaints and the training guide for personnel assigned to the IAQ Management Program.

To better assist implementation, the overall program is divided into sections. Following general background information and overall policies, these sections roughly correspond to the functional areas determined to have a significant impact on IAQ.

.Within each section, there are relatively consistent subsections to further define the roles and responsibilities as they relate to indoor air quality .This sectional approach was designed to reduce the volume of material required for review by each functional group, while the consistent format within each section was designed to better assist those with overall responsibility for the program.

Personnel within these functional areas (and therefore likely to impact indoor air quality) should be familiar with the program's background information presented in Sections 1, 2 and 3, and the particular section related to their field. It is not the intent of this program that all personnel be familiar with all aspects of this program. This program shall be made available for review upon proper request, and shall be consulted regularly in response to specific concerns.

Contents of Program

This program contains the practices, procedures, and methodologies that will assist UTA in reducing IAQ concerns at its campuses. This document also contains the policies and procedures for handling IAQ complaints and the training guide for personnel assigned to the IAQ Management V Program.

To better assist implementation, the overall program is divided into sections. Following general background information and overall policies, the remaining sections roughly correspond to the functional areas noted above. Each section is intended to more specifically address how those functions can impact indoor air quality. Within each section, there are relatively consistent subsections to further define the roles and responsibilities as they relate to indoor air quality .This sectional approach was designed to reduce the volume of material required for review by each functional group, while the consistent format within each section was designed to better assist those with overall responsibility for the program. The typical subsections include:

Typical Activities. This subsection lists the typical operational activities conducted for that department/building/function, etc. This is characteristically not a detailed, all-inclusive listing, but rather a general description of practices by group.

Sources of IA Q Problems. This subsection describes the typical types of IAQ problems that might be associated with a particular department/building/function as described above. Combined, these first two subsections serve to identify the department by its function or principal activities, and identify in general terms how those can affect IAQ.

Product Selection and Usage. This subsection presents a thought process and guidance for selecting products typically used within that department/building/function.

Communication/Notification. This subsection presents the typical course of action for department personnel or other staff when they suspect a potential IAQ problem. This subsection also includes typical protocols for notification of those who occupy a given building in the event that an IAQ problem is identified.

Protocols. This subsection outlines those department-specific practices, procedures and methodologies developed as a part of this program to specifically address IAQ issues.

Documentation. This subsection outlines the documentation required from each department as a part of this IAQ Program.

Sample Checklists. This subsection includes sample checklists and/or documentation required upon implementation of this program.

BACKGROUND ON IAQ ISSUES

Sources of IAQ Problems

Over the past several decades, exposure to indoor air pollutants has increased due to a variety of factors. These include but are not limited to the construction of more tightly sealed buildings, reduced ventilation rates to save energy , the use of synthetic building materials and furnishings, and the use of chemically-formulated personal care products, pesticides, and housekeeping supplies. In addition, management decisions, such as deferring maintenance to "save" money, can lead to IAQ problems. In the most general terms, basic factors that affect IAQ include:

- Differing sources of indoor air pollutants-
- Heating, ventilation, and air-conditioning (HV AC) systems.
- Pollutant pathways.
- Building occupants.

Indoor air contaminants can originate within the building or be drawn in from outdoors. If pollutant sources are not controlled, IAQ problems can arise, even if the HV AC system is properly operating. Air pollutants consist of numerous particulates, fibers, mists, bio-aerosols, and gases. It may be helpful to think of air pollutant sources as fitting into one of the categories in the table shown below.

In addition to the number of potential pollutants, another complicating factor is that indoor air pollutant concentrations can vary by time and location within the campus building, or even a single classroom. Pollutants can be emitted from point sources (such as from chemical storage areas or rooms) or from area sources (such as newly painted surfaces) and pollutants can vary with time (such as only once each week when floor stripping is done) or continuously (such as fungi growing in the HVAC system).

Airflow patterns, and resultant pollutant pathways, in buildings result from the combined forces of mechanical ventilation systems, human activity, and natural effects. Air pressure differences created by these forces move airborne pollutants from areas of higher pressure through any

available openings in building walls, ceilings, floors, doors, windows, and HVAC system.

An inflated balloon is an example of this driving force. As long as the opening to the balloon is kept shut, no air will flow, but when open, air will move from inside (area of higher pressure) to the outside (area of lower pressure). Even if the opening is small, air will move until the pressures inside and outside are equal.

HVAC/Ventilation Systems

IAQ problems are frequently associated with existing or recently modified heating, ventilating, and air-conditioning (HVAC) systems. For purposes of this program, HVAC systems include all heating, cooling, and ventilating equipment serving the campus. Overall, the existing UTA campus facilities include approximately 3,000 pieces of air handling HVAC equipment, of which approximately 800 are considered "major" air handling units, The remaining approximately 2,200 units are various types of equipment, down to and including "window-type" air conditioning units, I that have been installed at various times within approximately the past 50 years.

In general terms, properly designed, maintained and functioning HVAC systems should:

- Control temperature and humidity to provide thermal comfort.
- Distribute adequate amounts of outdoor air to meet ventilation needs of facility occupants.
- Isolate and remove odors and pollutants through pressure control, filtration, and exhaust fans.

As noted above, UTA currently operates and maintains a wide variety of HVAC systems. Not all HVAC systems are designed to accomplish all of the functions noted above. Some buildings rely only on natural ventilation. Others lack mechanical cooling equipment, and many function with little or no humidity control. The two most common HVAC systems used at UTA are unit ventilators and central air handling systems. Both generally perform the same HVAC functions, but the central air handling systems typically serve multiple rooms or building areas while a unit ventilator typically serves a single room.

Temperature and relative humidity can affect comfort and indoor air quality .Changing thermostat

settings or opening windows to try to control temporary fluctuations in temperature can worsen comfort and control problems and also have an adverse effect on other parts of the building. Comfort for all occupants is a worthy objective, but due to various comfort requirements and clothing levels among occupants, a more practical goal is assuring that at least 90 percent of the occupants are comfortable.

Other Building Systems

Printing and duplicating equipment can generate indoor air pollutants. Common types of duplicating equipment include: photocopiers, spirit duplicating machines, mimeograph machines, diazo dyeline (blueprint) machines, electronic stencil makers and computer (laser) printers. Spirit duplicating machines and diazo (blueprint) machines present particular IAQ problems due to the presence of methyl alcohol and ammonia, respectively. Local exhaust ventilation for this equipment is important to remove emissions from the area.

Ventilation is the process by which stale indoor air is exhausted to the outside and outdoor air is I. drawn into the building. A particular building may have mechanical and/or natural ventilation (i.e., windows). Improperly operated or poorly maintained ventilation systems may cause IAQ problems. Odors may indicate a ventilation problem. The ventilation system can carry air pollutants from one location in the building to another.

Local exhaust fans and fume hoods can be used to prevent air pollutants from accumulating in, or spreading beyond, the local area or classroom. Local exhaust fans may be used to exhaust entire rooms (e.g., bathrooms, locker rooms, or workshops). Fume hoods are appropriate for activities that generate pollutants in a localized area within a room (e.g., science experiments, spray painting, and welding) to collect and remove the emissions or airborne particulates from the area.

Combustion appliances are potential sources of carbon monoxide and other combustion gases. Carbon monoxide is odorless yet toxic, so it is important that these appliances are properly vented to remove combustion gases. If inadequate combustion air is available to an appliance, air may be pulled, or backdrafted, down the flue, bringing combustion gases back into the indoors instead of exhausting them outside.

Biological Sources

Biological sources of indoor air quality problems are most commonly mold and mildew. Three factors are necessary for the growth and proliferation of molds: spores, a food source, and water. Mold and mildew can grow almost anywhere that offers a food source (organic material) and a small amount of moisture. They do not require standing water in order to grow. Because of the presence of mold in outside air, it is nearly impossible to remove their presence from the air inside a building. Thus, it can safely be stated that the mold spores will be present in most cases.

Molds can grow on basically any source of organic material. Cellulose (such as present in paper, cardboard, the sheathing on gypsumboard, etc) provides an excellent nutrition source and, again, it is very commonly found throughout buildings. Filtration in HV AC systems is also critical to prevent buildup of dirt (nutrients), particularly in ducts with interior liners where particulates can accumulate over time.

Because of the prevalent nature of the first two factors, the third factor -water -becomes very significant in the control of mold growth. Any minor increase in moisture content can be enough to spark a mold bloom.

Excess moisture can result from condensation on cold surfaces, leaking or spilled liquid or excess humidity. The higher the relative humidity, the higher the probability of fungal growth. Myriad substances/materials, even in minute quantities, can serve as nutrient sources for fungi fungal spores are virtually ubiquitous; the key to preventing fungal growth in buildings building systems is limiting the amount of water available.

Many people have allergic reactions to mold and mildew. Recent medical research has linked exposure to mold growth in indoor environments to severe allergic reactions and attacks of asthma in those persons who are susceptible. These problems are not reported to be specifically linked to the more toxic molds or fungi (such as *Stachybotrys chartarum* or *Aspergillus niger),* b exposures to excessive concentrations of common environmental molds and fungi. Re consensus documents on this topic (ACGIH, New York City Department of Health, Center Disease Control and Prevention, et al.) view microbial growth within habitable building space, articles or furnishings, or within HVAC system components as undesirable, regardless of genera and species involved.

At present, there are no government regulations defining the term "excessive concentrations

fungi. Nevertheless, concentrations of airborne fungi indoors that substantially exceed those found in comparable outdoor samples, or indoor samples with a composition by species and/or genera that is markedly different than that identified in comparable outdoor samples should be viewed indicators of potentially problematic conditions.

Other Sources

Regular and thorough classroom cleaning is important to ensure good indoor unsanitary conditions attract insects and vermin, leading to possible IAQ problems from animal or insect allergens or pesticide use. The presence of dirt, moisture, and warmth also stimulate growth of molds and other microbiological contaminants.

By reducing the amount of dust and dirt that enters campus facilities, and by reducing the am of dust that leaves vacuum bags and dust cloths, it will be possible to maintain clean ca facilities with less effort. Cleaner campus facilities can also have positive physical and psychological effects on the students and staff. Complaints of illness and discomfort have V associated with buildings having high dust levels.

Visible accumulations of particulates can serve as cues to occupants that something is amiss with the building's air quality and thereby trigger complaints. In addition to dust, other particles such as pollens, which can cause allergic reactions, will also be reduced.

Outside air can also be a source of indoor air quality problems. Dust, pollen, mold spores other airborne pollutants may be entrained in the outside air entering the building. Volatile or compounds (VOCs) and carbon monoxide, particularly where fresh air intakes are located vehicle parking and service areas, can be drawn into the building. Exterior building maintenance activities, such as roof repairs or replacement, or pest control treatments, can also generate vapors fumes, and mists near fresh air intakes.

Indoor air pollutants are also generated by the occupants and activities within a particular building. Just in the normal process of respiration, occupants give off carbon dioxide which can build exceed recommended levels in high-occupancy spaces and/or spaces with inadequate ventilation. Exterior occupant activities, such as smoking just outside air intakes or doorways, can generate indoor air pollutants.

Chemical Usage

Maintenance supplies may emit air contaminants during use and/or storage. Products 10 emissions are generally preferable. However, a product that is low in emissions is not necessarily better if it is more hazardous despite the lower emissions, if it has to be used more often, or higher strength. Cleaning solution(s), pesticides and similar chemicals may contain hazardous constituents that can off-gas, creating an airborne hazard after used. In addition, such products also cause problems if mixed (i.e. mixing ammonia-based toilet cleaners and bleach will release chlorine gas).

Additionally, the federal Pollution Prevention Act of 1990 mandated that facilities begin reporting the quantities of specific chemicals used or stored at a given facility on an annual basis. The list of chemicals is extensive and includes 579 individual chemicals and 28 chemical categories as shown under the Emergency Planning and Community Right-to-Know Act (EPCRA), Section 313. EPA instituted a voluntary chemical reduction program in 1991 called the 33/50 Program targeted 17 priority chemicals on the TRI reporting list.

The EPA's 33/50 Program targeted 17 priority chemicals and set as its goal a 33% reduction in releases and disposal of these chemicals by 1992 and a 50% reduction by 1995, measured against 1988 baseline. Two of the organic compounds (carbon tetrachloride and 1,1,1-trichloroethan also considered ozone-depleting substances (ODS). While not all of these substances may readily affect indoor air quality, positive steps taken to reduce their use are recommended. The 17 initially targeted chemicals under the EP A's 3 program include:

Chemical Name Synonyms and Trade Names Benzene Benzol, Phenyl hydride
Carbon Tetrachloride, Carbon chloride, Freon 10, Freon 104, Tetrachloromethane
Chloroform Methane trichloride or trichloromethane
Dichloromethane Methylene Chloride or Methylene dichloride
Methyl ethyl ketone (MEK) 2-Butanone peroxide, ethyl methyl ketone peroxide, ME MEK hydroperoxide
Methyl isobutyl ketone Hexone, MmK, 4-MethyI2-pentanone, isobutyl methyl ketone
Tetrachloroethylene Perchloroethylene, PCE, perk
Toluene Methyl benzene, Methyl benzol, Phenylmethane, Toluol -1,1,I-Tricholorethane
Chloroethene, Methyl Chloroform .Trichloroethylene Ethylene trichloride, TCE, Trichloroethene, Trilene
Xylenes Dirnethylbenzene, Xylol, othro-, Meta- and Para-xylene Cadrnium and cadrnium compounds
Chromium and chromium compounds Cyanide compounds
Lead and lead compounds
Mercury and mercury compounds Nickel and nickel compounds

Building Products

Asbestos. UTA has identified and dealt with asbestos in the campus buildings under state federal requirements. Refer to the asbestos management plan when considering whether planned renovations or activities will require disturbing areas containing asbestos.

Lead-Based Paint. In some cases, lead-based paint may be the correct product for a particular application. Although the use of lead-based paint has been regulated in housing applications its use has not been specifically prohibited by regulation for commercial or educational facilities maintenance uses.

Care should be taken when choosing paints to avoid lead-based paint if they are not necessary for the particular application. Special care should be taken when sanding a surface to prepare for painting, due to the dust released into the air. The dust may contain lead particles. Exposure to excessive levels of lead could affect a child's mental growth, and interfere with nervous system development, which could cause learning disabilities and impaired hearing. In adults, excessive lead exposure can adversely affect the central and peripheral nervous systems, digestive system, reproductive system, and blood pressure.

In addition, some activities may cause fuming or volatilization of lead (such as torch-cutting metal primed with lead-based paint) that may contribute to indoor air quality problems. Use appropriate personnel and precautions when using, removing and disposing of lead-based paint.

Off-Gassing. New products contain constituents (such as resins, solvents, and binders) which release volatile organic compounds for a period of time. This process is called "off-gassing." Examples of products that will potentially off-gas include:

- Wall paneling.
- 8 .Draperies-
- Composite wood furniture and cabinets.
- Cubicle dividers.
- Carpet and vinyl flooring. .Paints and finishes.

Painting. There are many factors to consider before beginning a painting project. The type of paint is an important decision. For instance, both solvent-based and water-based paints give off volatile organic compounds (VOCs) that could lead to IAQ problems. In general, water-based

paints produce less VOCs than solvent-based paints, but produce them over a longer period of time.

Durability is important -a relatively low-emitting paint might create more IAQ problems in the long run than a higher-emitting paint, if the low-emitting paint requires repainting more often. In addition, many water-based paints (even interior paints) have, until recently, used mercury as a fungicide. Any paint that contains mercury should not be used indoors.

Flooring. As is the case with other building materials and furnishings, flooring materials have the potential to impact indoor air quality , therefore selection of flooring materials is an important consideration during the renovation process. Potential pollutants from flooring materials that can impact IAQ include volatile organic compounds (VOCs) that off-gas directly from many flooring materials (such as vinyl tile and mastics) and the cleaning products used to maintain the flooring. Dirty and persistently damp flooring materials can become a location for the growth of biological contaminants, such as fungi. Proper cleaning and maintenance of flooring materials helps to improve IAQ.

General Health Effects

The typical effects of IAQ problems on building occupants are often non-specific symptoms rather than clearly defined illnesses. Symptoms commonly attributed to IAQ problems include:

- Headache, fatigue, and shortness of breath.
- Sinus congestion, cough, and sneezing.
- Eye, nose, throat, and skin irritation.
- Dizziness and nausea.

All of these symptoms, however, may also be caused by other factors, and are not necessarily due to air quality deficiencies. Environmental stressors such as improper lighting, noise, vibration, overcrowding, poor ergonomics, and psychosocial problems (such as job or home stress) can produce symptoms that are similar to those associated with poor air quality , but often require very different solutions.

Because of varying sensitivities among people, one individual may react to a particular IAQ problem while surrounding occupants do not display ill effects. In other cases, complaints may be widespread. In addition to different degrees of reaction, an indoor air pollutant or problem can trigger different types of reactions in different people. Groups that may be particularly susceptible to the effects of indoor air contaminants include, but are not limited to:

- .Allergic or asthmatic individuals, or people with sensitivity to chemicals.
- People with respiratory disease.
- People whose immune systems are suppressed due to radiation, chemotherapy, or disease.
- Contact lens wearers.

Prevention of IAQ Problems

Once you understand the basic principles and factors that influence indoor air quality, you will note that the specific activities involve two major actions the management of pollutant sources, and the use of ventilation for pollutant control. There are six basic control methods for lowering concentrations of indoor air pollutants.

Source Management. This method generally includes source removal, source substitution, and source encapsulation. Source management is the most effective control method when it can be " practically applied. Source removal is very effective. Examples of source removal include , prohibiting buses, trucks and cars from idling near outdoor air intakes, not placing garbage in rooms with HV AC equipment, and banning smoking within campus facilities. Source substitution simply includes action such as selecting a less toxic art material, cleanser or interior paint. Source encapsulation involves placing a barrier around the source so that it releases fewer pollutants into the indoor air (e.g., abatement, pressed wood cabinetry with sealed or laminated surfaces).

Local Exhaust. This method is very effective in removing point sources of pollutants before they can disperse into the indoor air by exhausting the contaminated air outside. Well known examples include restrooms and kitchens where local exhaust is typically used. Other examples of pollutants that originate at specific points and that can be easily exhausted include science lab and housekeeping storage rooms, printing and duplicating rooms, and vocational/industrial areas

(such as welding or painting booths).

Ventilation. Ventilation through the use of cleaner (outdoor) air to dilute the polluted (indoor) air that people are breathing. Generally, local building codes and/or national association standards specify the quantity (and sometimes quality) of outdoor air that must be continuously supplied to an occupied area. For situations such as painting, pesticide application, or chemical spills, temporarily increasing the ventilation can be useful in diluting the concentrations of potential contaminants.

Exposure Control. This method includes administrative controls such as adjusting the time of use and location of use of a material that can adversely affect IAQ. An example of time of use would be to strip and wax floors on Friday after the week's activity in the affected building has ceased, so that the floor products have a chance to off-gas over the weekend, reducing the number of persons exposed to odors or contaminants in the air due to lower campus occupation. Location of use deals with moving the contaminating source as far as possible from occupants, or relocating susceptible occupants.

Air Cleaning. This method primarily involves the filtration of particles from the air as the air passes through the ventilation equipment. Gaseous contaminants can also be removed, but in most cases this type of system should be engineered on a case-by-case basis.

Education. Education of the campus occupants regarding IAQ is critical. If people are provided information about the sources and effects of contaminants under their control, and about the proper operation of the ventilation system, they will better understand their indoor environment and can act to reduce their personal exposure.

EH&S COMPLAINT RESPONSE

Documenting The Complaint

As indicated in previous sections, notifications of planned or apparent indoor air quality concerns are to be forward to the IAQ Program Coordinator. The IAQ Program Coordinator is to maintain files of potential and apparent indoor air quality problems. The files at a minimum shall include:

- Documentation of the issues noted and resolved immediately in the field.
- Issues noted and reported to supervisory personnel for further assessment, as well as problem resolution for those issues.
- Problems assessed by shop supervisors and forwarded to EH&S as beyond the scope of shop personnel to solve, as well as resolution of the problem.

Such files are to be maintained by building or facility, and in chronological order for ease of access.

Investigating The Complaint

Diagnosing symptoms that relate to IAQ can be tricky. Acute (short-term) symptoms of IAQ problems typically are similar to those from colds, allergies, fatigue, or the flu. There are clues that can serve as an indicator of a potential indoor air problem:

- The symptoms are widespread within a class or within the building.
- The symptoms disappear when the students and/or staff leave the campus building for a day.
- The onset is sudden after some change at the building, such as painting or pesticide application.
- Persons with allergies, asthma, or chemical sensitivities have reactions indoors but not outdoors.
- A doctor has found that a student or staff member has an indoor air-related illness. .

However, a lack of symptoms does not ensure that IAQ is acceptable. Symptoms from long-term health effects (such as lung cancer due to radon exposure) often do not become evident for many

years.

If you receive complaints that seem to indicate a potential IAQ problem and the problem is self-evident, then attempt to correct the problem. If the problem cannot be corrected, or if the complaint seems to indicate a potentially severe IAQ problem, contact the IAQ Coordinator immediately. The IAQ Coordinator may ask you questions to try to identify whether you have overlooked potential causes of the problem (such as, "Has anything changed?"), and then may call in other help from within or outside the campus to investigate further .

Communication

Because indoor air problems can jeopardize the health of students and staff, parents and the public may react strongly to reports of bad indoor air quality on campus. With this in mind, it is recommended that you follow the communications guidelines established by the IAQ Coordinator. Usually, this will involve referring questions from the public and media to one central source, the IAQ Coordinator for your campus. In this way, students, parents, staff, and the public will not become alarmed by conflicting or wrong information, and will have a consistent and complete source of information regarding the quality of the indoor air on campus.

Resolving The Complaint

In addition to the practices, policies and procedures contained herein, complaint resolution activities should be performed in general accordance with general industry standards and guidelines including but not limited to Environmental Protection Agency Document *"Building Air Quality,"* December 1991; ASHRAE Standard 62-1999 *"Ventilation for Acceptable Indoor Air Quality";* ASHRAE Standard 55-1992 *"Thermal Environmental Conditions for Human Occupancy";* and the *American Conference of Governmental Industrial Hygienists* (ACGIH) *"Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices".*

Sample Checklists

Sample forms are included with regard to complainant interviews and overall surveys.